



On July 20th, 2016, DEP joined the Newtown Creek Alliance for a canoe tour of Newtown Creek



DRAFT

Newtown Creek Combined Sewer Overflow Long Term Control Plan

Public Kickoff Meeting

Location: Newtown Creek WWTP

Date: November 15, 2016

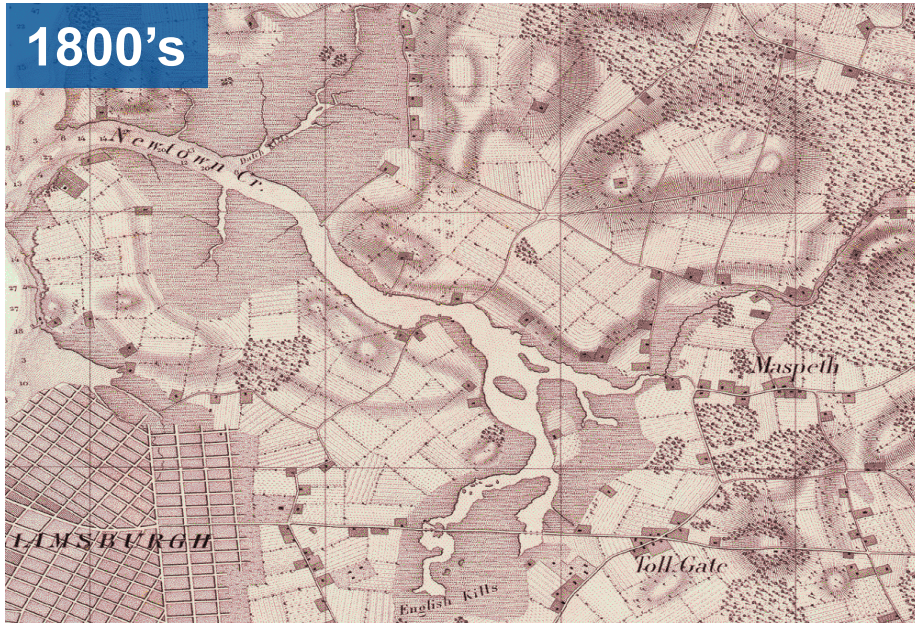
Topic		Speaker
1	Welcome & Introductions	Mikelle Adgate
2	Waterbody & Watershed Characteristics and Water Quality Sampling	Keith Mahoney
3	Water Quality Improvement Projects <ul style="list-style-type: none">• Grey Infrastructure• Green Infrastructure	Keith Mahoney Pinar Balci
4	LTCP Modeling & Alternative Development Process	Keith Mahoney
5	Next Steps	Mikelle Adgate
6	Discussion and Q&A Session	All

Welcome & Introductions

Mikelle Adgate
Director of Stormwater Management Outreach
DEP – BPA

Newtown Creek: Historical Context

1800's



- The shoreline of Newtown Creek in the 1800's – the system has since been drastically altered.

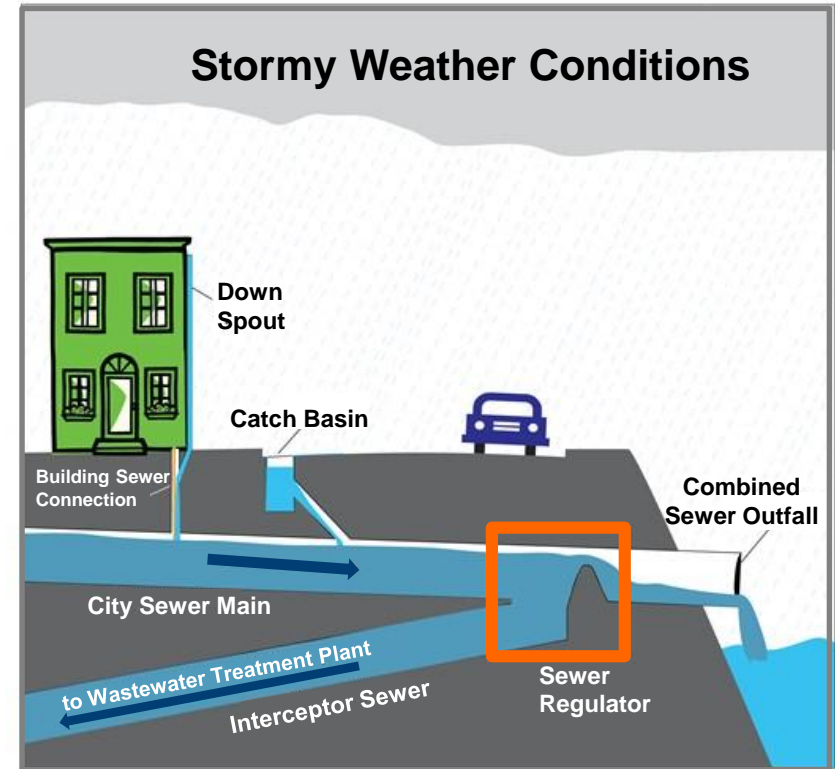
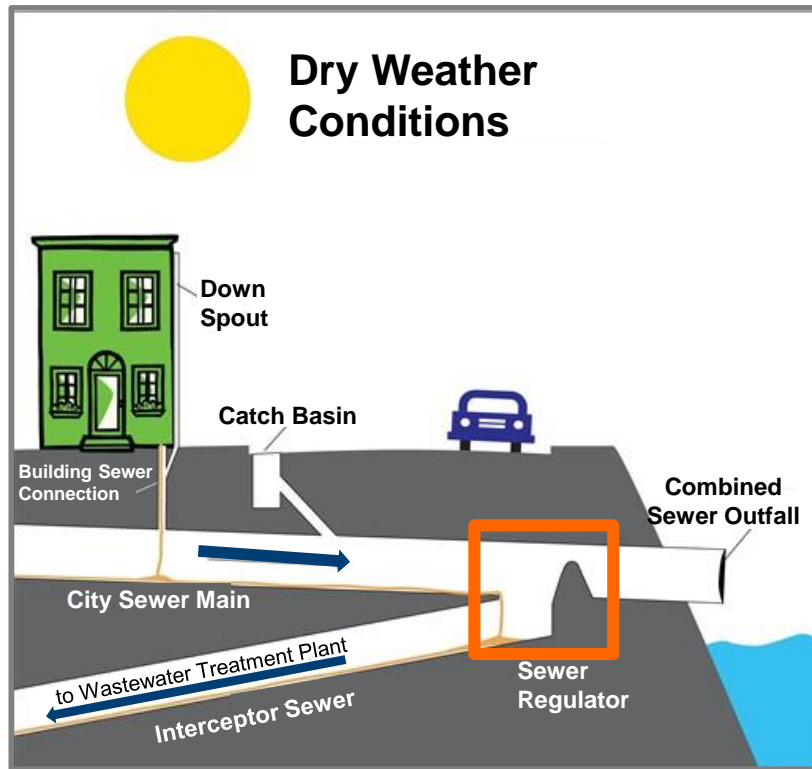
TODAY



- Urban development throughout the decades has led to a highly impervious watershed in Newtown Creek.

What is a Combined Sewer Overflow (CSO)?

- NYC's sewer system is approximately 60% combined, which means it is used to **convey both sanitary and storm flows**.



- 65% to 90% of **combined** sanitary & storm flow is captured at treatment plants.
- When the sewer system is at full capacity, a diluted mixture of rain water and sewage may be released into local waterways. This is called a combined sewer overflow (CSO).

- Rainfall characteristics that trigger a CSO event at Newtown Creek:
 - **0.05 to 0.27-inch** of constant rainfall over a period of 2 to 10 hours
 - Of the average 100 rainfall events per year about **63%** may trigger a CSO at Newtown Creek



Photo Credit: Baptisete Pons

<https://www.flickr.com/photos/bpt/2882285636/>

Long Term Control Plan (LTCP)

identifies appropriate CSO controls to achieve applicable water quality standards

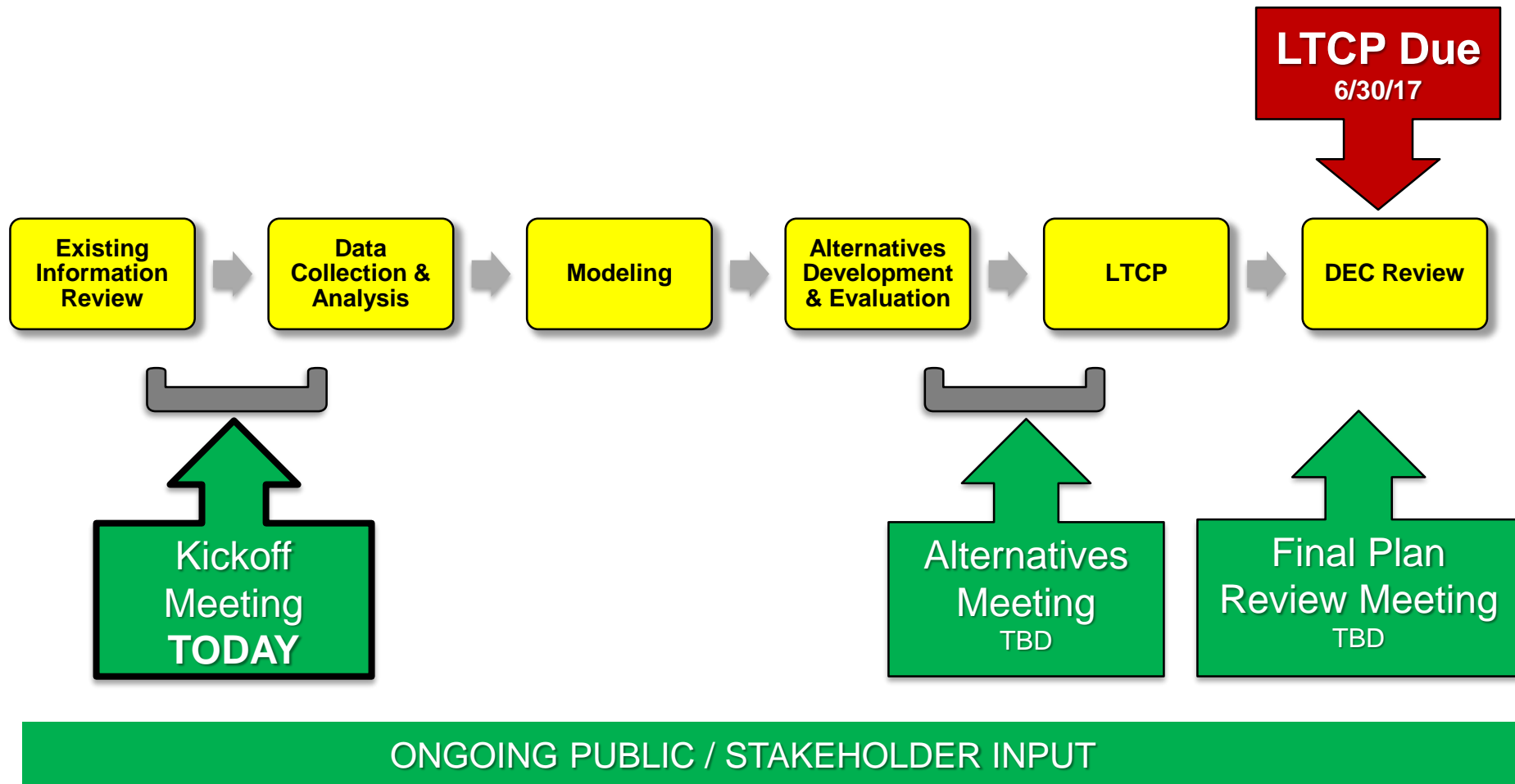
consistent with the Federal CSO Policy and Clean Water Act

CSO Consent Order

an agreement between NYC and DEC that settles past legal disputes without prolonged litigation

DEC requires DEP to develop LTCPs and mitigate CSOs

LTCP Process and Public Involvement

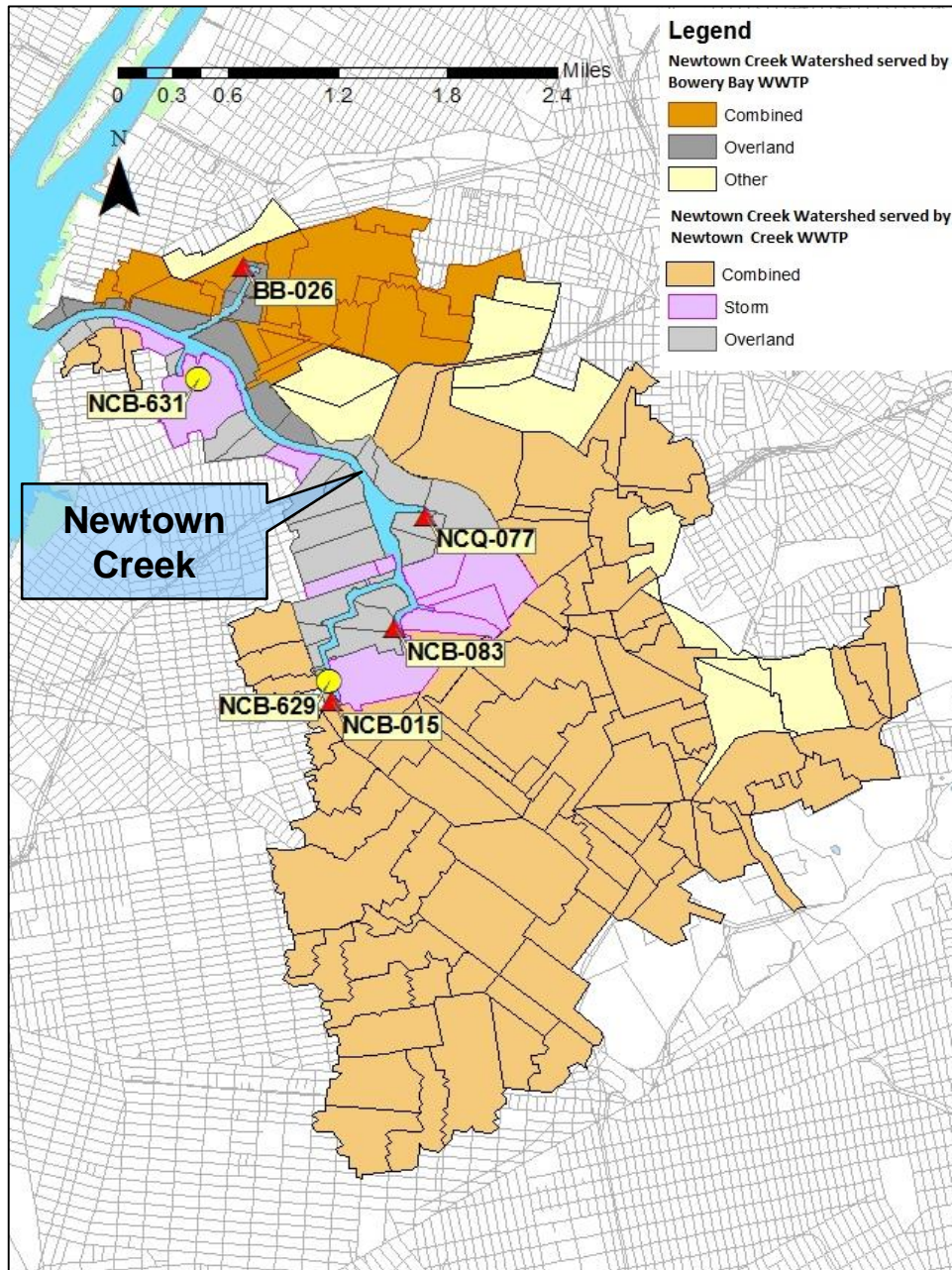


Questions?

Waterbody & Watershed Characteristics and Water Quality Sampling

Keith Mahoney, P.E.
Director of Water Quality Planning
DEP – BEDC

Newtown Creek Drainage Area



➤ 5 Urban CSO Tributaries

- English Kills
- East Branch
- Maspeth Creek
- Dutch Kills
- Whale Creek

➤ Sewer System

- Sewersheds:
 - Newtown Creek (NC): 16,256 acres
 - Bowery Bay (BB): 16,105 acres
- 4 CSO Outfalls (▲)
- 2 DEP owned MS4 Outfalls (●)

➤ Annual Wet-Weather Discharge Volume

- 1,176 MG CSO (85%)
- 204 MG MS4 Direct Drainage and Stormwater (15%)

Drainage Area	
Total Acres	6,972
Served by Combined Sewers	68%

CLASS SD

Fish Survival

The **best usage** of Class SD water is **fishing**. These waters shall be suitable for fish, shellfish, and wildlife survival. In addition, the water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

Parameter	Criteria*	DEC Water Quality Parameter Reference
Fecal Coliform	Monthly Geometric Mean ≤ 200 col/100 mL	<ul style="list-style-type: none"> • New York Codes, Rules and Regulations • (NYCRR Part 703.4)
Total Coliform	Monthly Geometric Mean $\leq 2,400$ col/100 mL $80\% \leq 5,000$ col/100 mL	<ul style="list-style-type: none"> • New York Codes, Rules and Regulations • (NYCRR Part 703.4)
Dissolved Oxygen	≥ 3.0 mg/L (acute, never less than)	<ul style="list-style-type: none"> • New York Codes, Rules and Regulations • (NYCRR Part 703.3)



* EPA has also proposed a potential future RWQC for enterococcus: 30-Day Rolling GM ≤ 30 col/100 mL.

➤ CSO LTCP Goals and Targets:

- Annual and Seasonal Bacteria Compliance
- Annual Dissolved Oxygen Compliance
- Time to Recovery for Bacteria of ≤ 24 hours
- Floatables Control

Ongoing Receiving Water Sampling Programs



Program	Sampling Frequency	#of Sampling Locations	Parameters		
			Fecal	Entero	*YSI
 Harbor Survey Monitoring	Monthly (Oct – May) Weekly (Jun – Sept)	4	✓	✓	✓
 Sentinel Monitoring	Quarterly	4	✓		

*YSI Parameters include: Dissolved Oxygen, Temperature, Conductivity, and Salinity.

● Receiving Water

- 14 locations
- Four 4-day events
- Fecal, Entero, YSI, TSS

▲ CSO / ▲ MS4 Sampling

- 4 CSO, 2 MS4 locations
- 4 wet weather events
- Fecal, Entero, YSI, TSS, CBOD, Nitrogen

◆ SOD

- 6 locations
- 2 dry & 2 wet-weather events

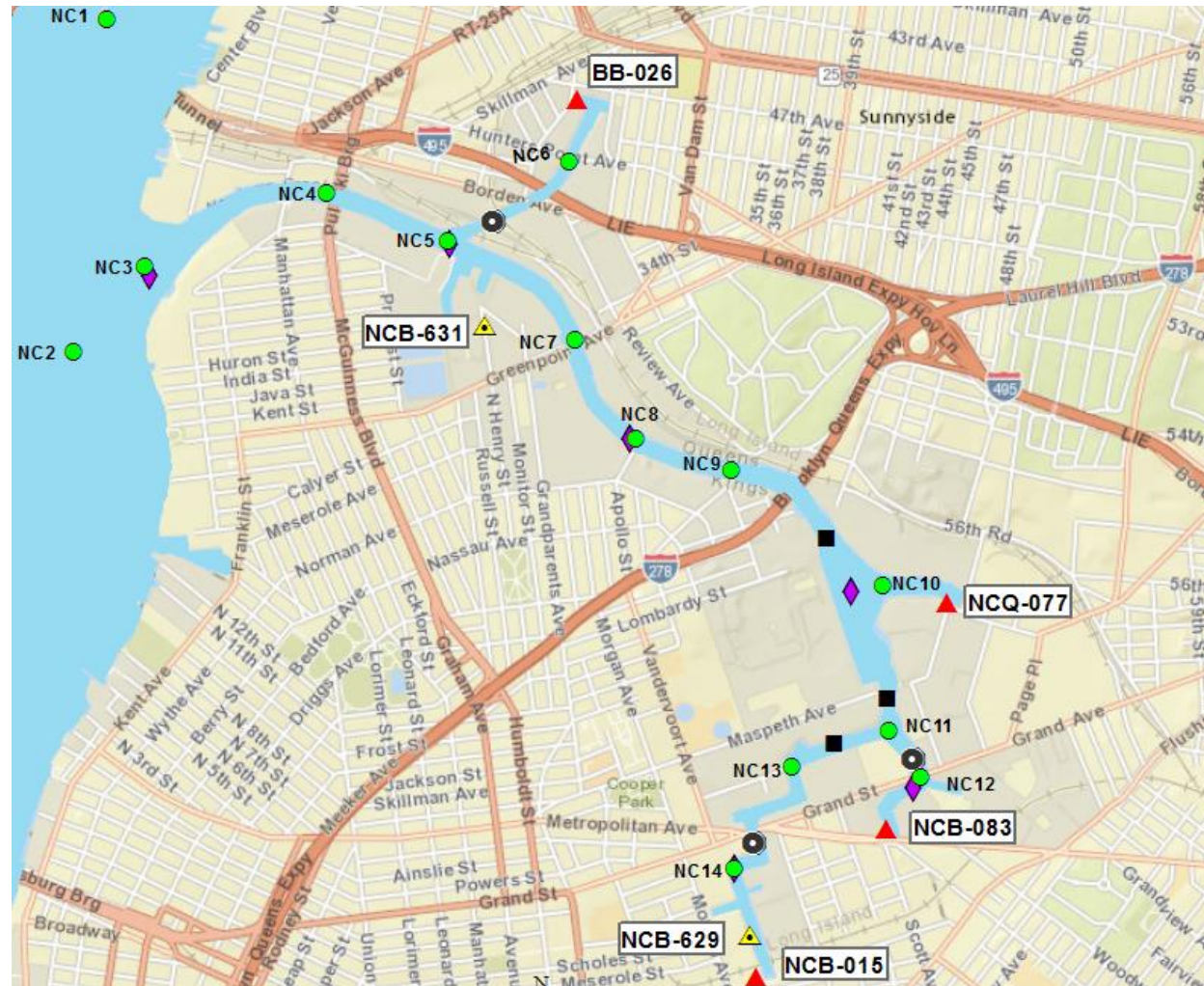
● Data Sondes / ■ ADCPs

- 3 locations
- Continuous over 60 days
- Temperature, DO, Salinity

Flow Monitoring

- 3/1/2014 – 3/31/2015
- 5 locations
- Continuously monitored
- Depth & Velocity measurements

Sampling Period: 7/1/2016 – 10/31/2016



Fecal Coliform Sampling – Geometric Means

January 1, 2016 to September 30, 2016

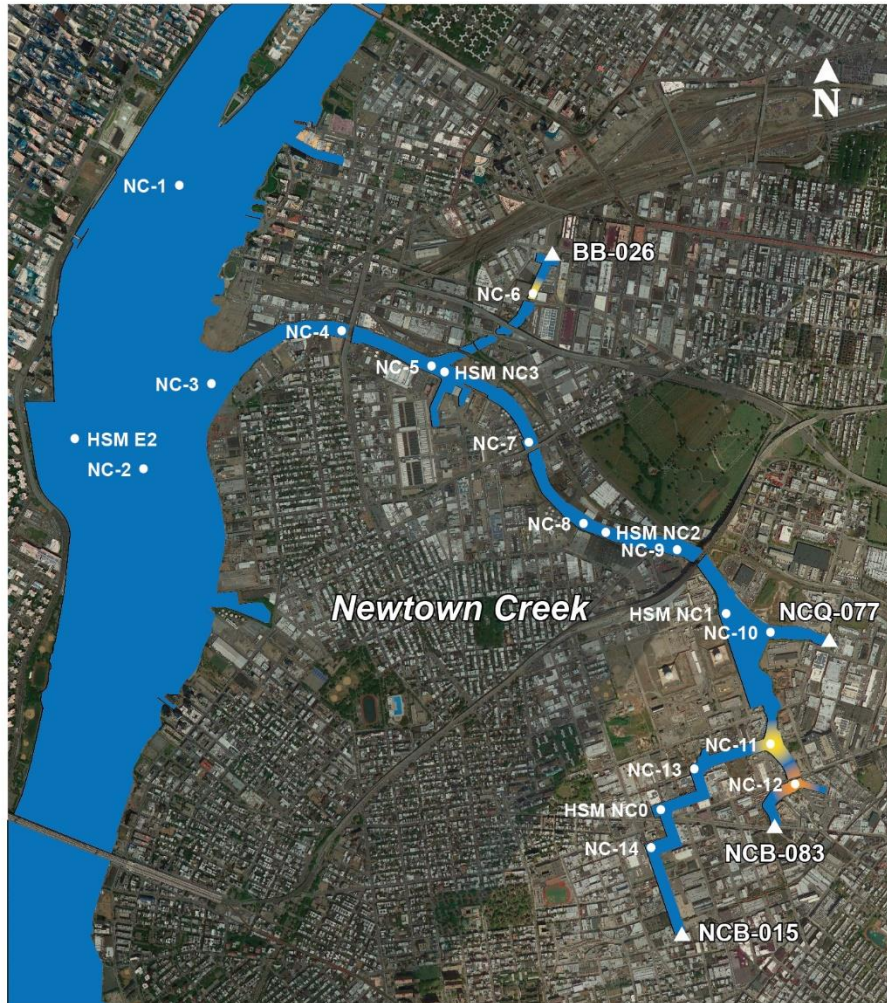
LTCP: ~6 Dry and ~38 Wet samples per location

HSM: ~14 Dry and ~28 Wet samples per location

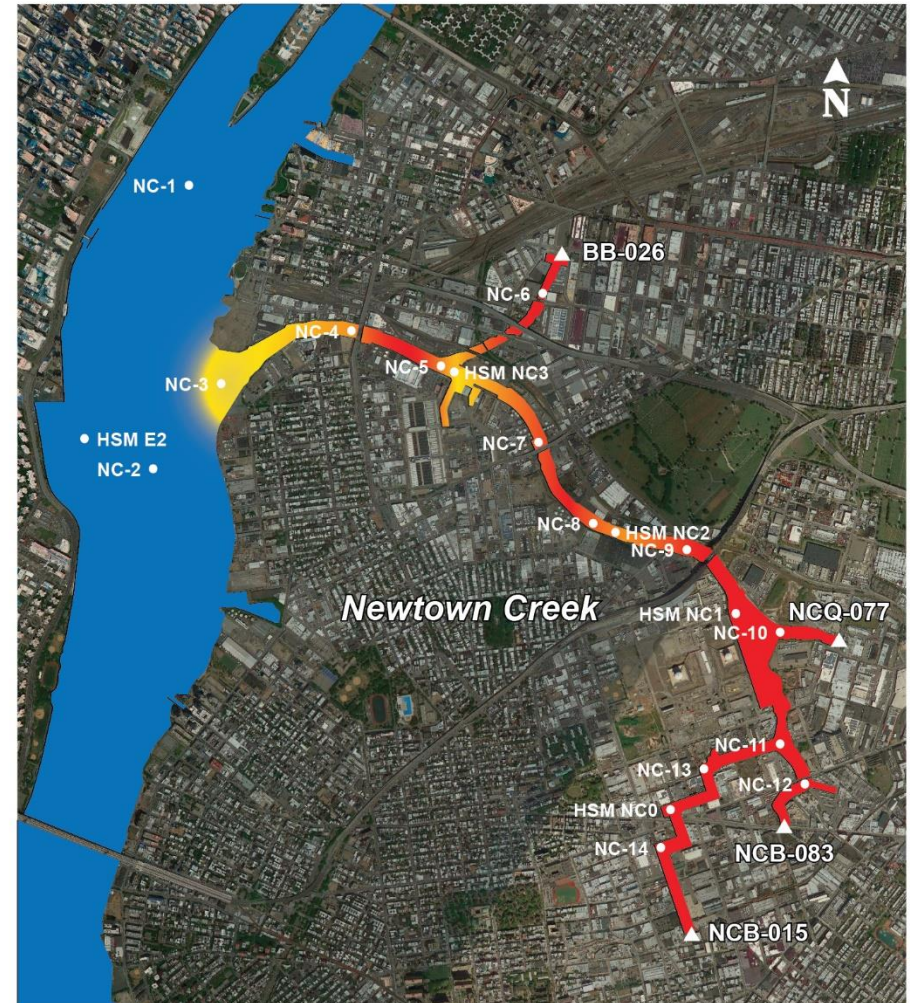
Scale (# col/100 mL)



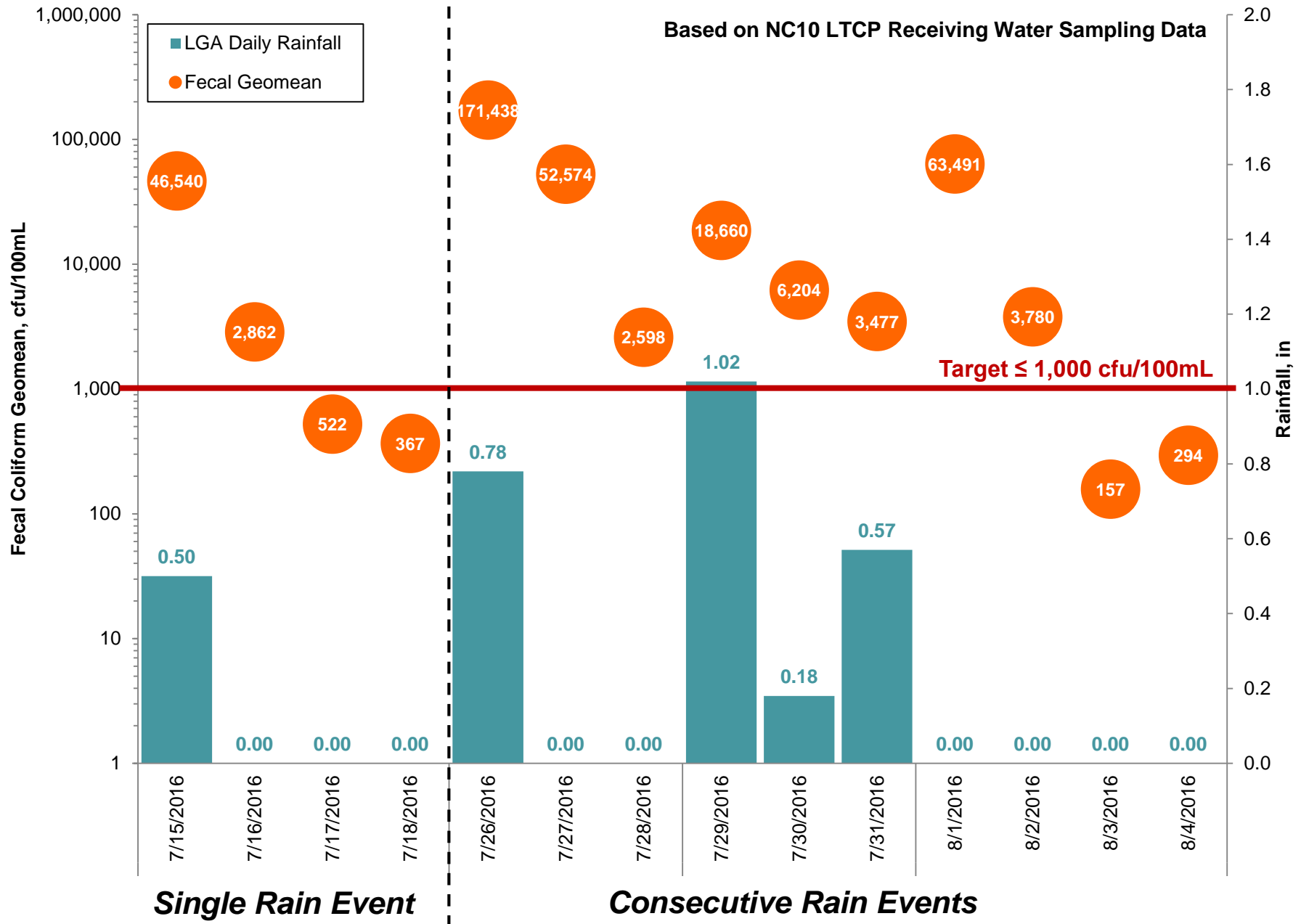
Dry Weather



Wet Weather



Fecal Coliform Recovery Over Time



Enterococci Sampling – Geometric Means

January 1, 2016 to September 30, 2016

LTCP: ~6 Dry and ~38 Wet samples per location

HSM: ~14 Dry and ~28 Wet samples per location

Scale (# col/100 mL)

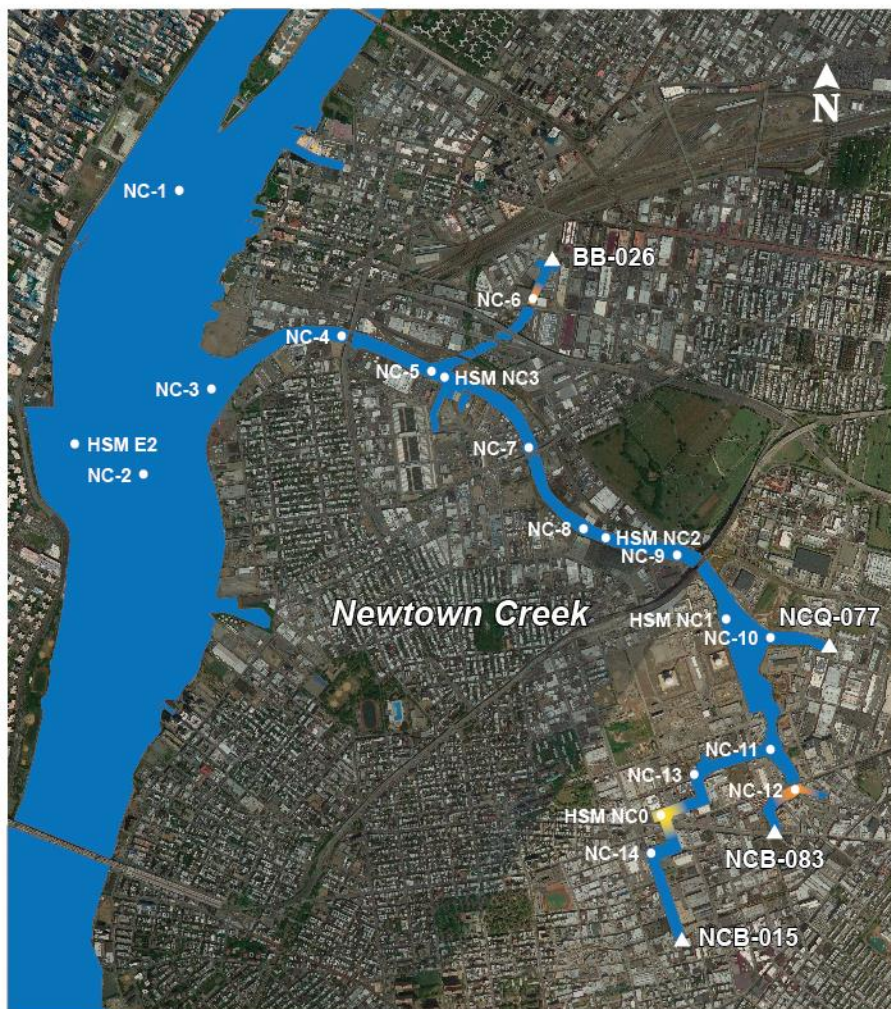
0-30

31-50

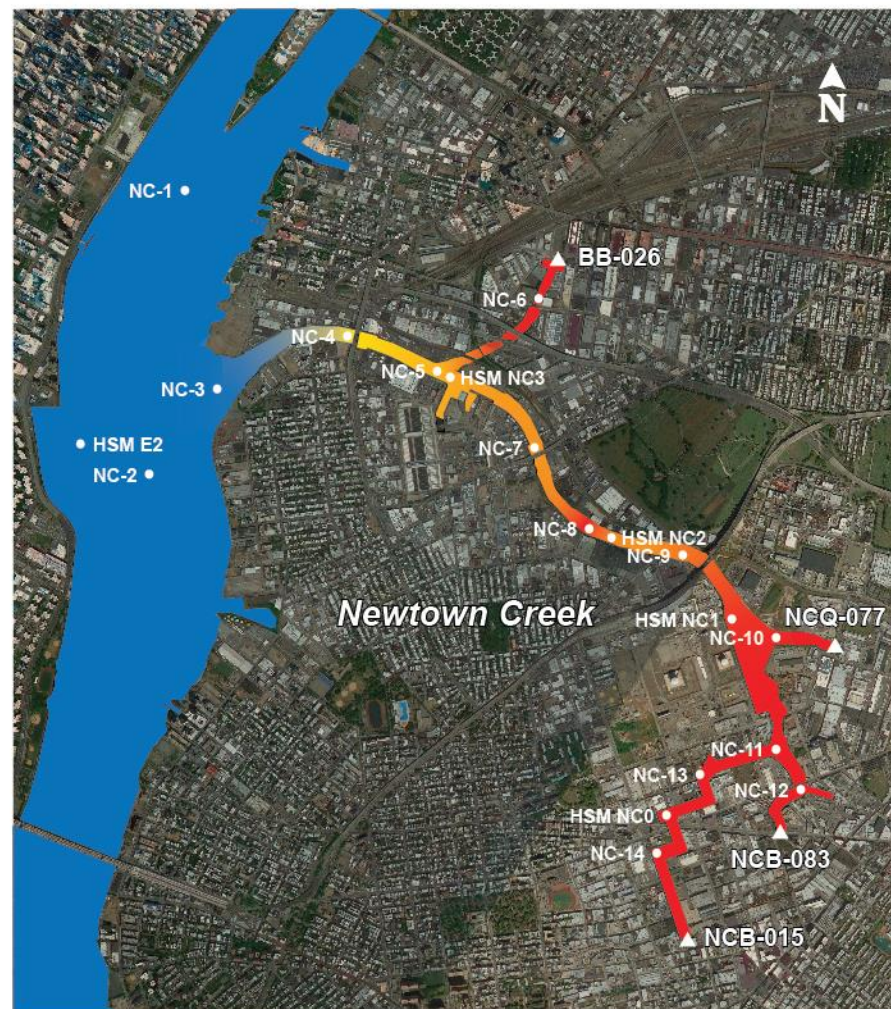
51-100

>100

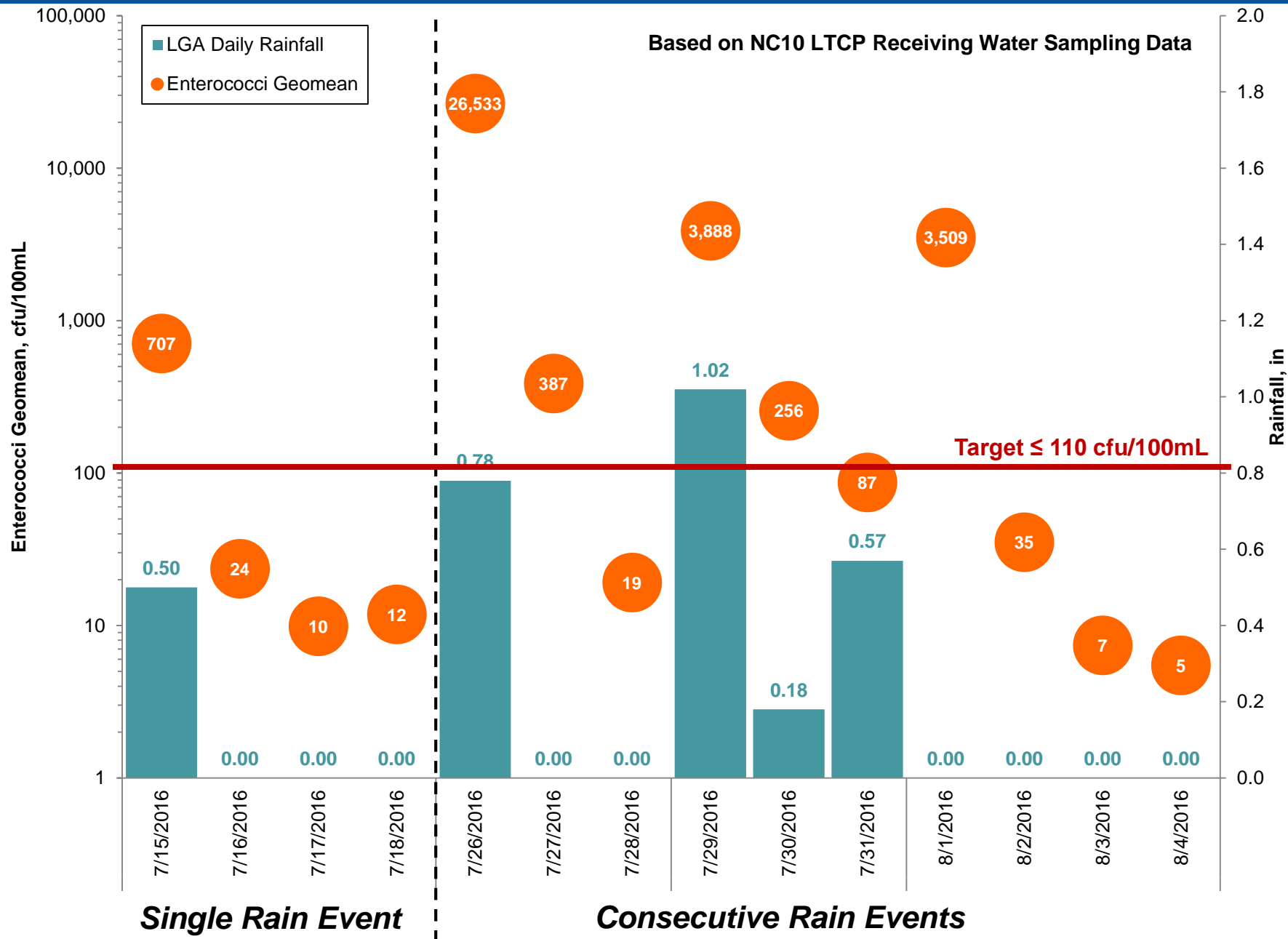
Dry Weather



Wet Weather



Enterococci Recovery Over Time



Dissolved Oxygen Sampling – 5th Percentile Values

January 1, 2016 to September 30, 2016

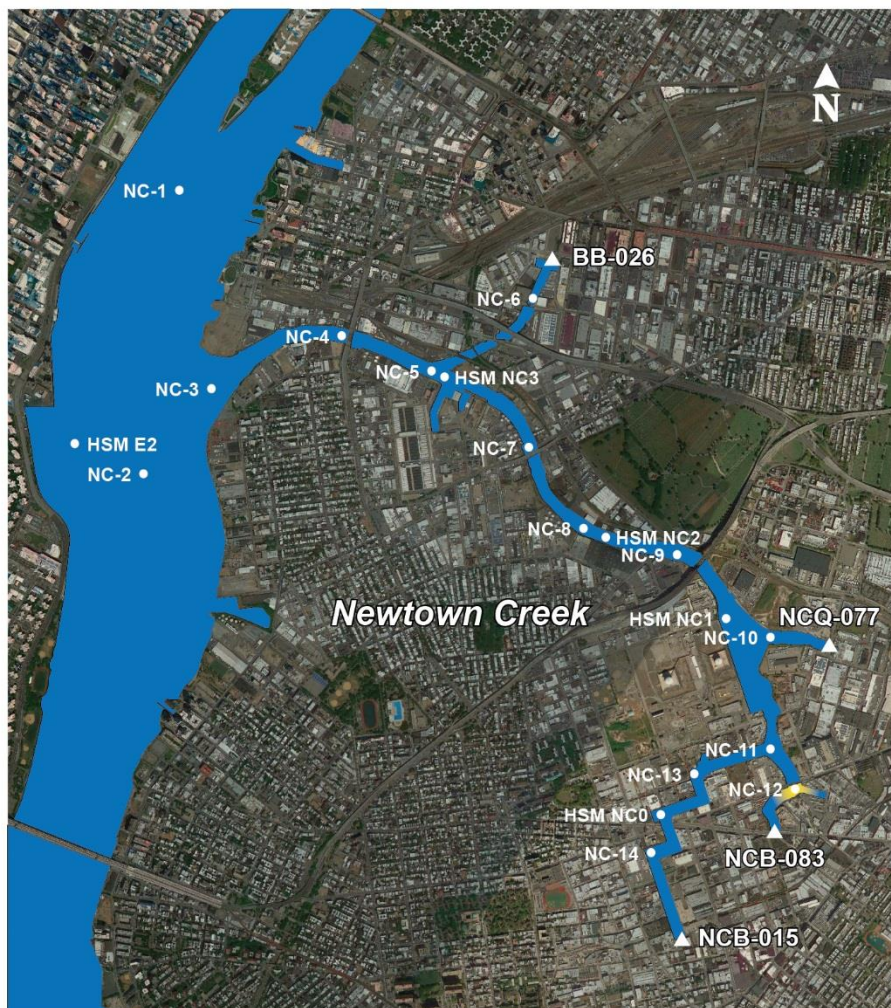
LTCP: ~6 Dry and ~38 Wet samples per location

HSM: ~14 Dry and ~28 Wet samples per location

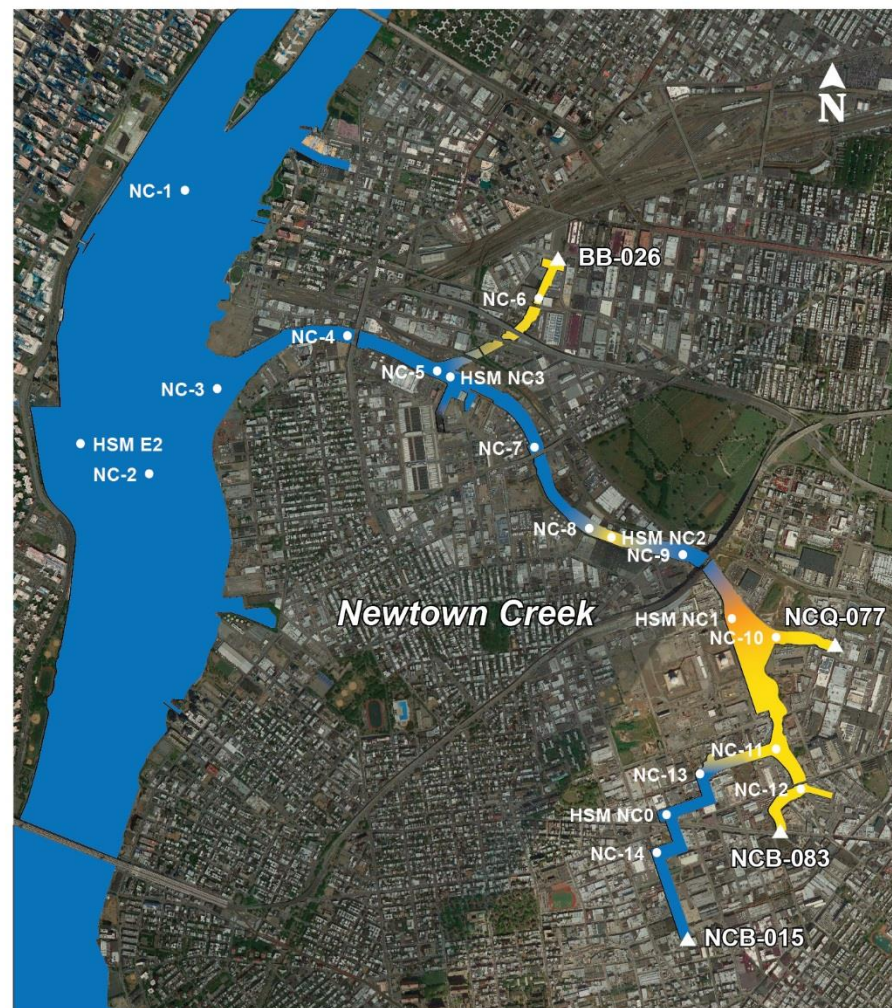
Scale (mg/L)



Dry Weather

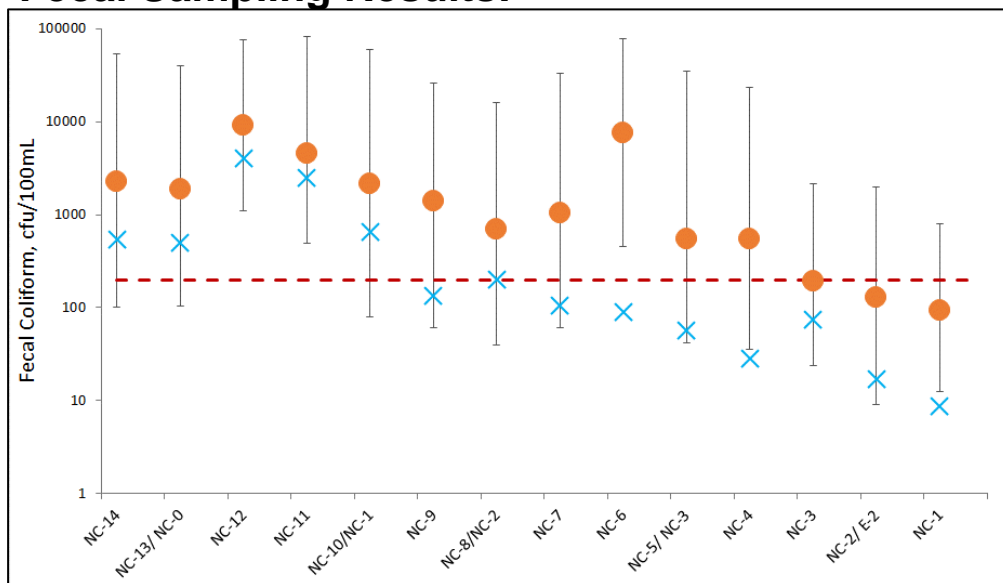


Wet Weather

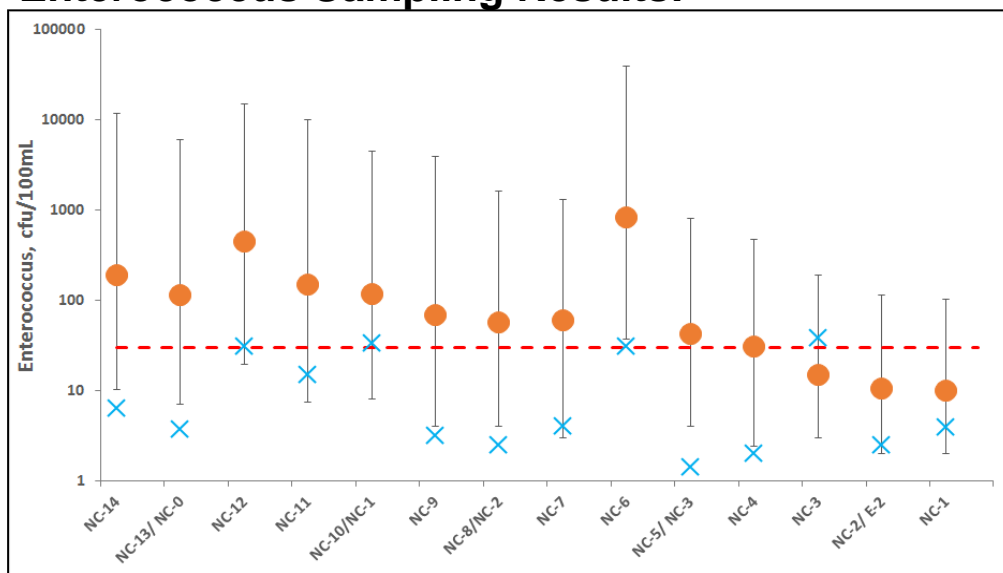


Canoe Excursion Sampling Results

Fecal Sampling Results:



Enterococcus Sampling Results:



- On July 20th, 2016, DEP joined the Newtown Creek Alliance for a canoe tour of Newtown Creek
- Sampling results from this excursion are within the ranges observed under the LTCP / HSM sampling programs

- GM of LTCP/HSM Sampling Results (1/1/16 – 9/30/16)
- ✕ Canoe Excursion Results (7/20/16) *Prior rainfall on 7/14 of 0.15-in
- Primary Contact Criteria
 - Fecal Monthly GM ≤ 200 cfu/100 mL
 - Entero 30-day Rolling GM ≤ 30 cfu/100 mL

Questions?

Water Quality Improvement Projects

Grey and Green Infrastructure

Keith Mahoney, P.E.

Director of Water Quality Planning
DEP – BEDC

Pinar Balci

Assistant Commissioner
DEP – BEPA

Newtown Creek: CSO Mitigation Projects

Recommended Project		Construction Cost	Status
1	Brooklyn/Queens Pump Station at Newtown Creek WWTP	\$300 M	Substantially Completed in 2013
2	Bending Weirs and Underflow Baffles	\$42 M	In-Construction thru 2017
3	In-Stream Aeration Projects (4)	\$60 M ¹	In-Construction thru 2020
4	Built and Planned GI Projects	\$45 M ²	Ongoing Design and Construction
Total = \$447 M			

1) Cost pending for Maspeth Creek aeration.

2) Cost to date, more GI projects may be pending.

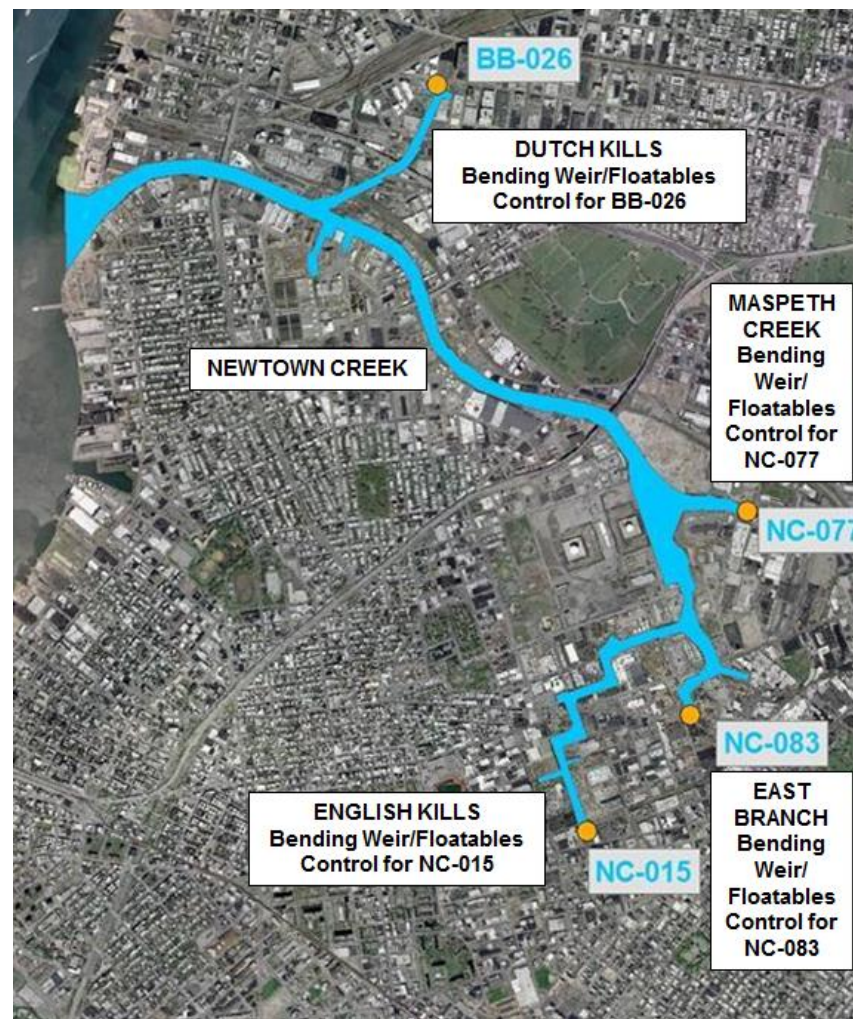
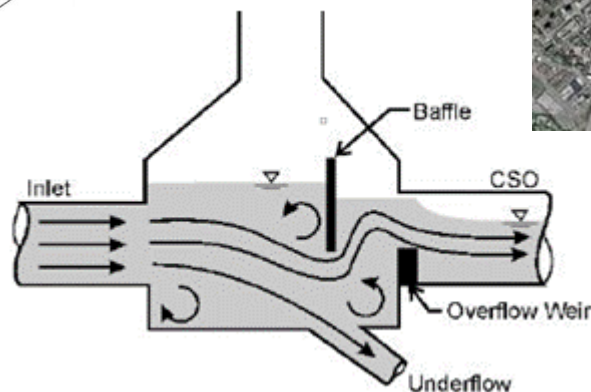
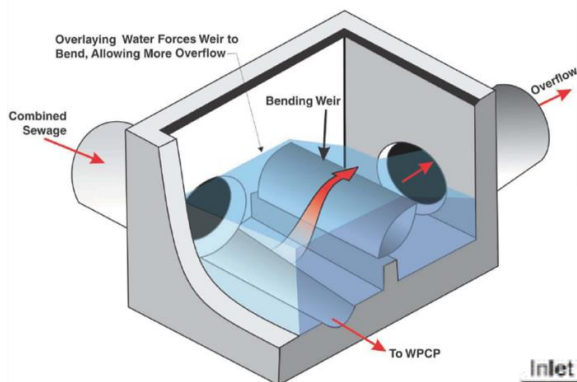
- Continued operation of the Brooklyn/Queens Pumping Station (PS) at NC WWTP
- PS Wet Weather Capacity = 400 MGD
- PS Upgraded in 2013: ~\$300 M
(includes 5 new MSPs, headworks upgrade, in-line storage facility, odor control)



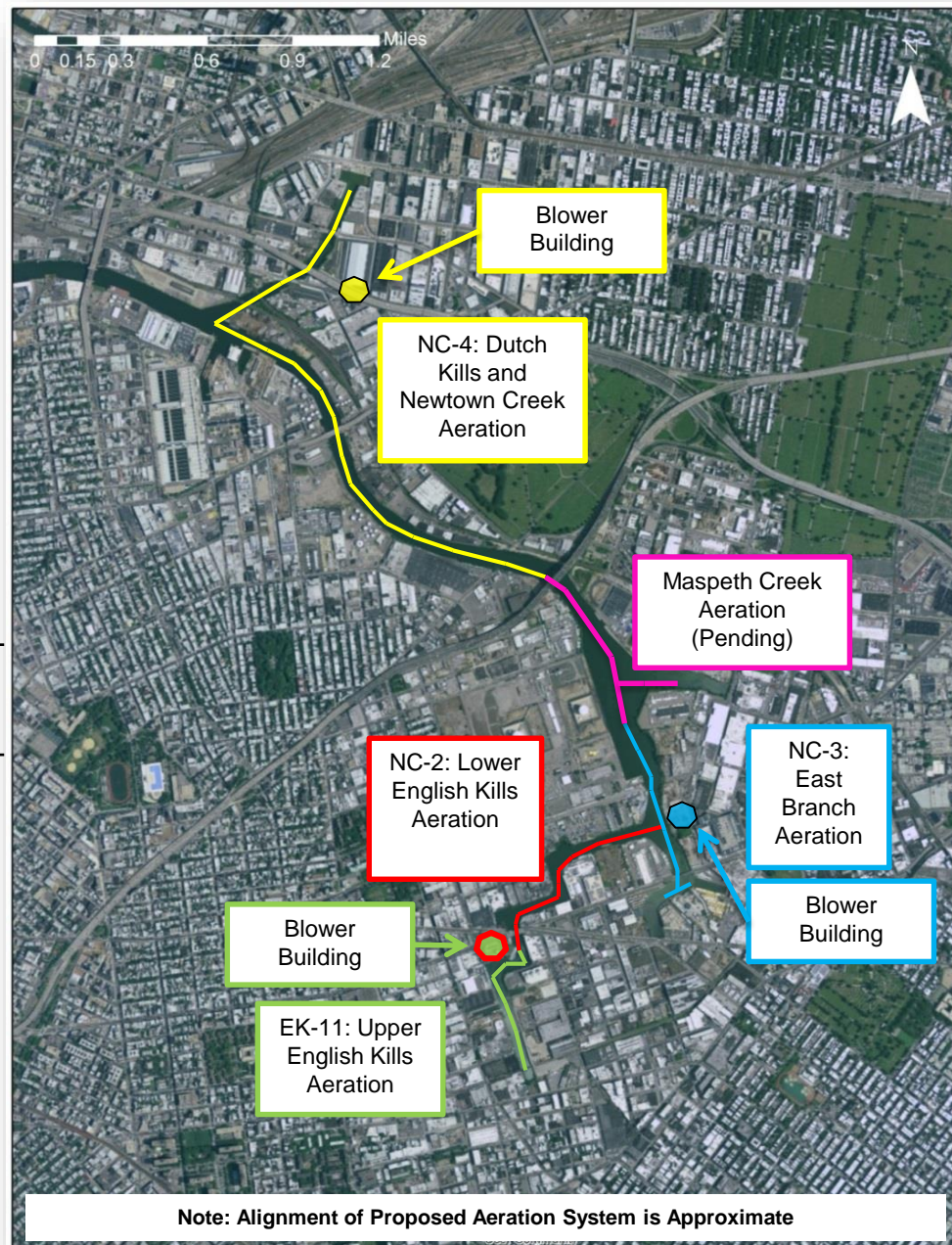
Bending Weir and Underflow Baffles

- Construction Cost: \$42 M
- Construction Completion: Dec. 2017
- Volume Reduction: 62 MGY
- Provides Floatables Control
- Being installed at 4 locations (●):
 - B-01 (NCB-015), NCQ-01 (NCQ-077), NCB-2 (NCB-083), BB-L4 (BB-026)

Typical Bending Weir



3 In-Stream Aeration Projects



Contract	Aeration Location	Construction Completion	Cost
EK-11	Upper English Kills	Dec. 2008	\$9.0 M
CSO-NC-2	Lower English Kills	Jan. 2014	\$2.2 M
CSO-NC-3	East Branch	Jun. 2018	\$18.0 M
CSO-NC-4	Dutch Kills and Newtown Creek	Dec. 2020	\$30.8 M
Pending	Maspeth Creek	Project on-hold pending results of clean-up operations in the Superfund area.	

- **Green Infrastructure (GI)** collects stormwater runoff from impervious surfaces, such as streets and roofs, reducing flow to sewers
- **\$1.5 billion** committed for GI Citywide to manage 1" of stormwater runoff from 10% of impervious combined sewered areas by 2030
- DEP will meet this goal through:
 - Area-Wide Contracts
 - Public Property Retrofits
 - Grant Program for Private Property Owners
 - Stringent Detention Rule for New Development



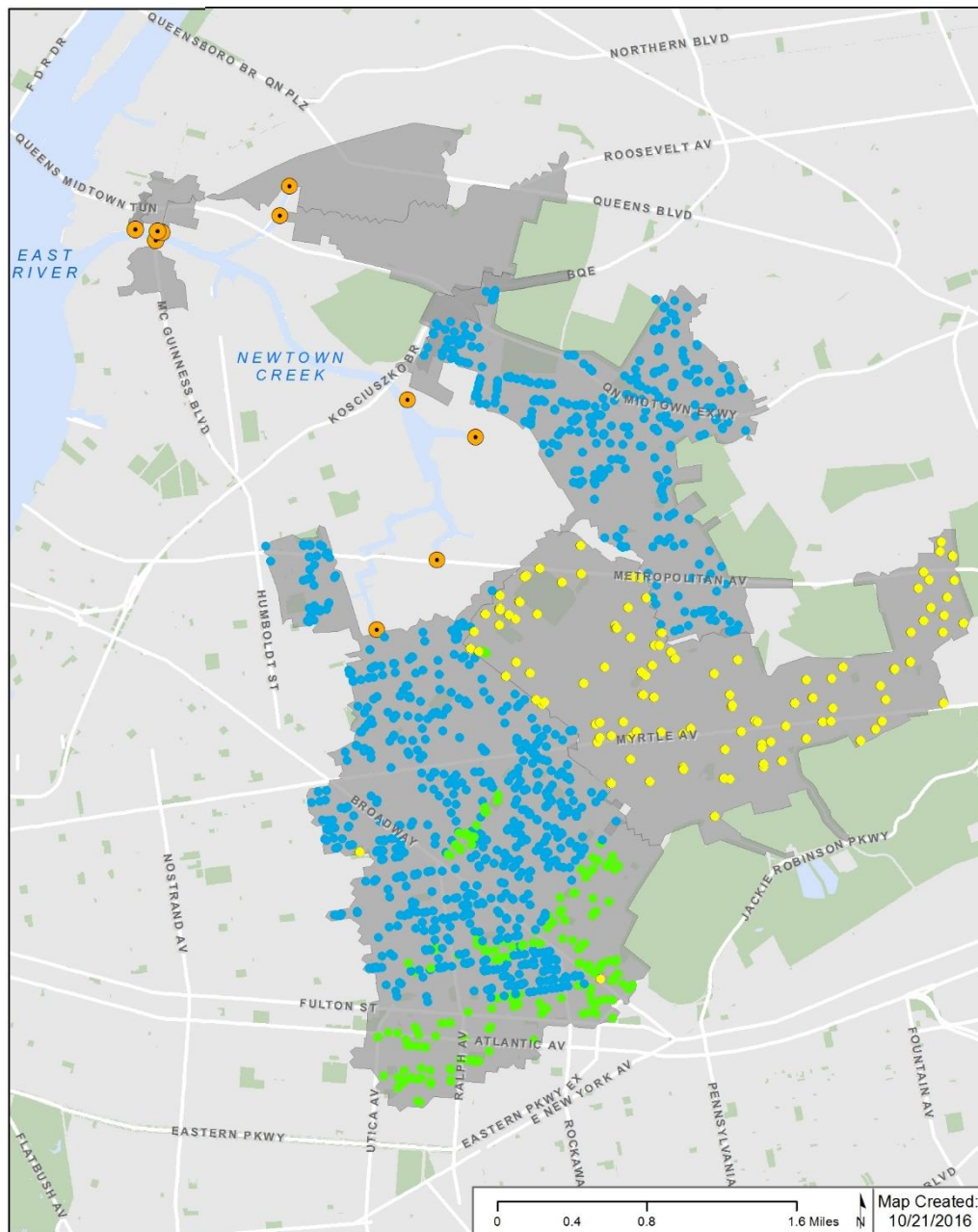
Rain Gardens



Permeable Pavers



Green Roofs



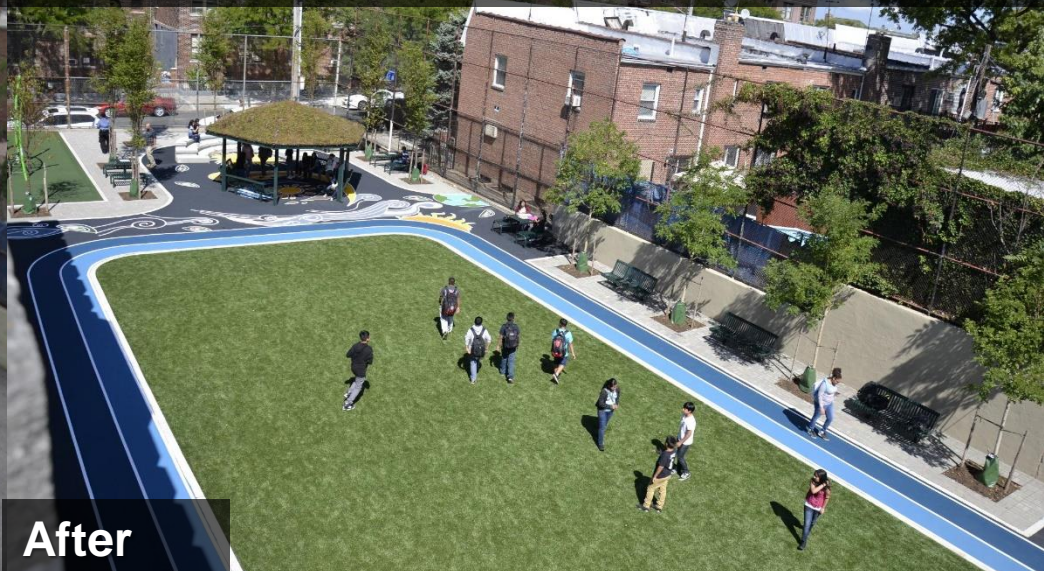
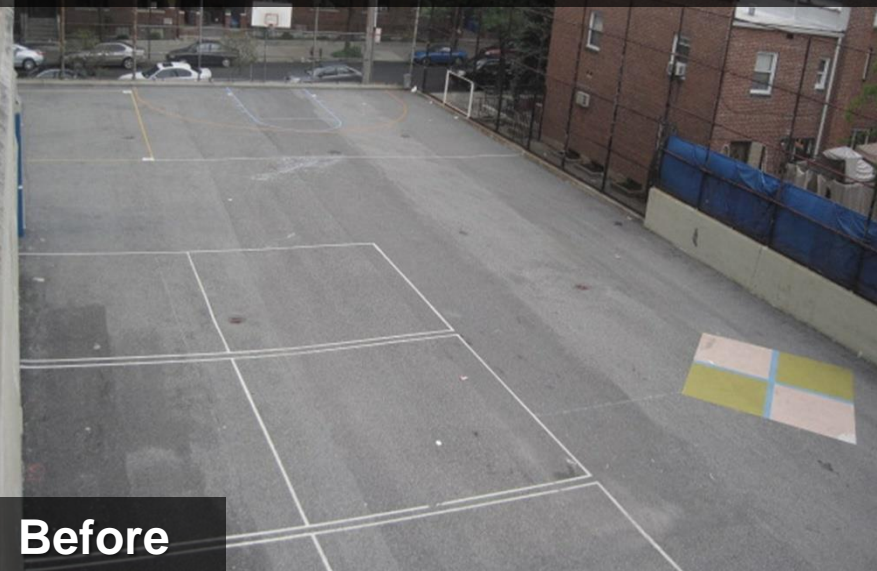
- More than 1,300 GI assets within streets, parks, and schools
- 98% are ROW Rain Gardens (aka bioswales)

Legend

- Waterbodies
- CSO Outfalls
- CSO Outfall Watersheds
- GI Constructed
- GI In Construction
- GI Planned

Public Property Retrofits in Newtown Creek

Junior High School 162 Willoughby
1390 Willoughby Ave, Bushwick



Before

After

Project Status	Parks/ Playgrounds	Public Schoolyards	NYCHA Housing Developments	Total
Potential	1	0	3	4
Preliminary	12	6	6	24
Schematic	4	2	0	6
Constructed	0	2	1	3
Total	17	10	10	37

➤ **Green Infrastructure Grant Program:**

DEP provides funding for the design and construction costs of green infrastructure on private property in combined sewer areas of the City.

➤ **Green Roof Tax Abatement:**

The City provides a one-year property tax abatement for private properties that install green roofs. The abatement value is \$5.23 per square foot (up to the lesser of \$200,000 or the building's tax liability) and is available through March 15, 2018.

➤ **New Private Incentive Program:**

DEP is currently developing a new private property green infrastructure retrofit initiative to augment its current efforts on stormwater management on private property. There will be an RFI released on 9/19 in which the Agency is seeking ideas on innovative program management structures for this new initiative.

➤ **2012 Stormwater Rule:**

In 2012, DEP amended the allowable flow rate of stormwater to the City's combined sewer system for new and existing development. Site Connection Proposals may include green infrastructure technologies to meet the new allowable rate.

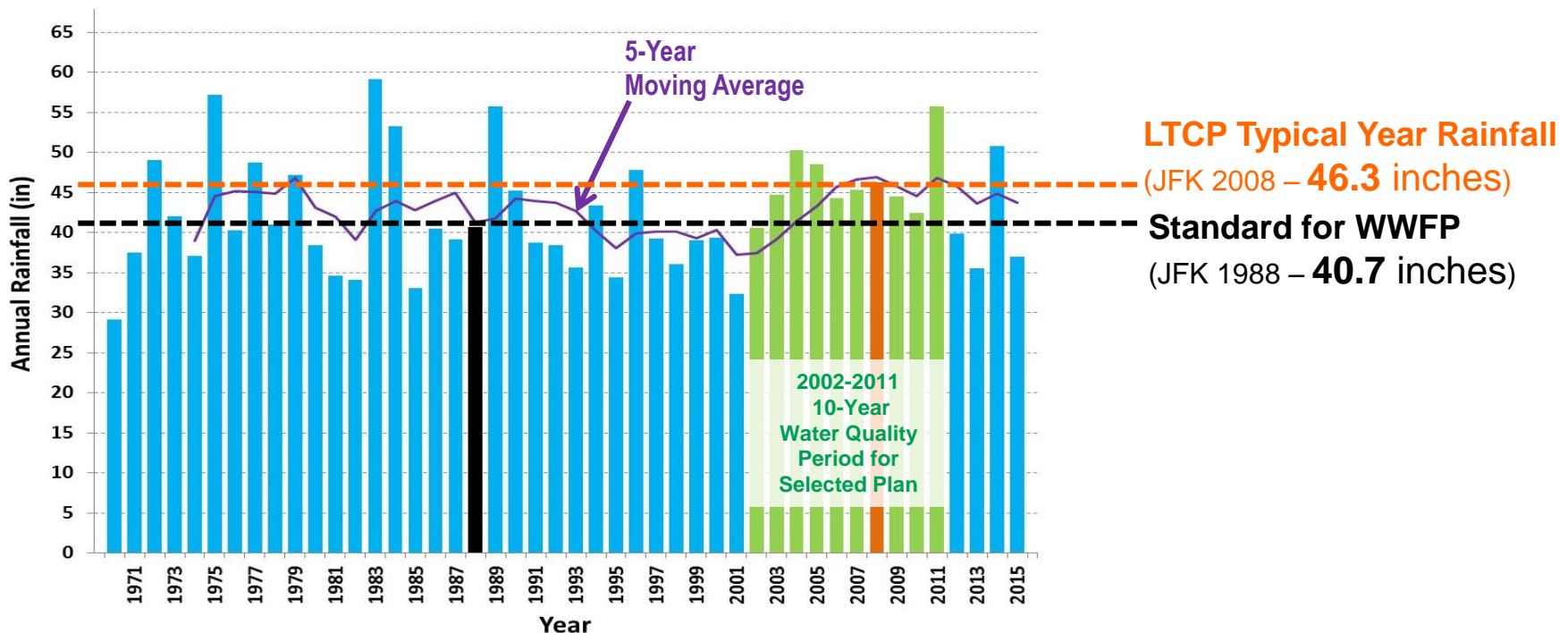
Questions?

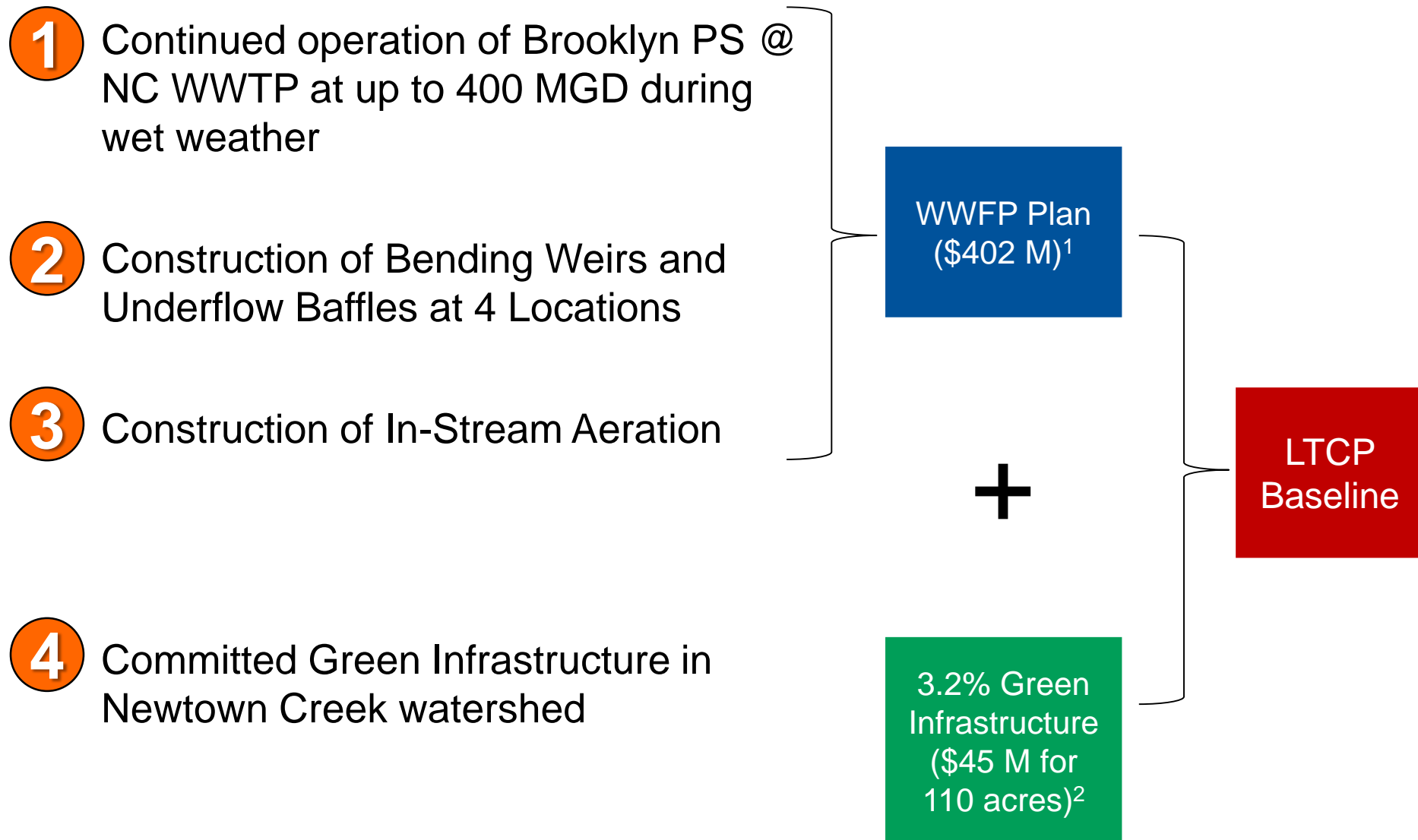
LTCP Modeling and Alternatives Development Process

Keith Mahoney, P.E.
Director of Water Quality Planning
DEP – BEDC

Model Calibration Inputs and Assumptions

- **Landside Model** calibrated based on flow monitoring data, gauge adjusted radar rainfall data, and satellite flyover impervious data
- **Water Quality Model** calibrated with Harbor Survey and LTCP sampling data
- Calibrated modeling inputs and assumptions include:
 - Committed CSO and BNR projects
 - 2040 sanitary flows and loads
 - JFK 2008 “Typical Year Rainfall” for Alternative Analysis
 - JFK 10-yr data (2001 to 2011) for baseline and selected alternatives





1) Cost pending for Maspeth Creek aeration.

2) Cost to date, more GI projects may be pending

1. Bacteria Source Component Analysis

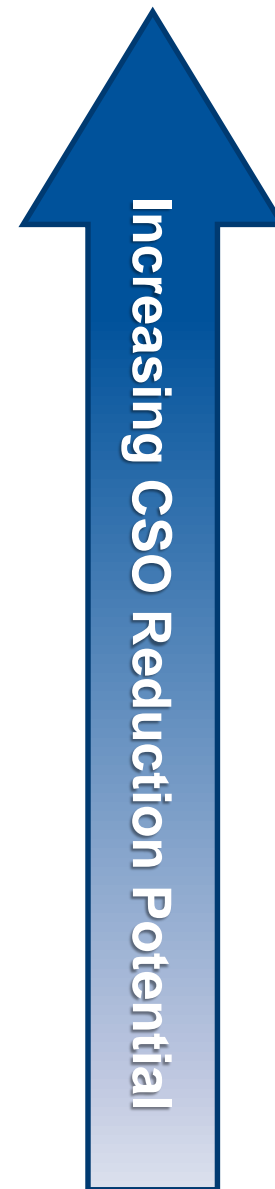
- CSO, stormwater and direct drainage

2. Gap Analysis for Water Quality Standard (WQS) Attainment

- Calculate bacteria and dissolved oxygen for:
 - Baseline Conditions
 - 100% CSO Control Conditions

3. Assess Levels of CSO Control Necessary to Achieve WQS

4. Identify Technologies to Cost-Effectively Achieve the Required Level of CSO Control



Sample Technologies:

- **Storage**
- **Treatment**
- **System Optimization**
- **Source Control**

CSO Mitigation Toolbox

INCREASING COMPLEXITY

INCREASING COST

Source Control	Existing GI	Additional GI	High Level Sewer Separation		
System Optimization	Fixed Weir	Parallel Interceptor / Sewer	Bending Weirs Control Gates	Pump Station Optimization	Pump Station Expansion
CSO Relocation	Gravity Flow Tipping to Other Watersheds	Pumping Station Modification	Flow Tipping with Conduit/Tunnel and Pumping		
Water Quality / Ecological Enhancement	Floatables Control	Environmental Dredging	Mechanical Aeration	Flushing Tunnel	
Treatment Satellite:	Outfall Disinfection	Retention Treatment Basin (RTB)		High Rate Clarification (HRC)	
Centralized:	WWTP Expansion				
Storage	In-System	Shaft	Tank	Tunnel	

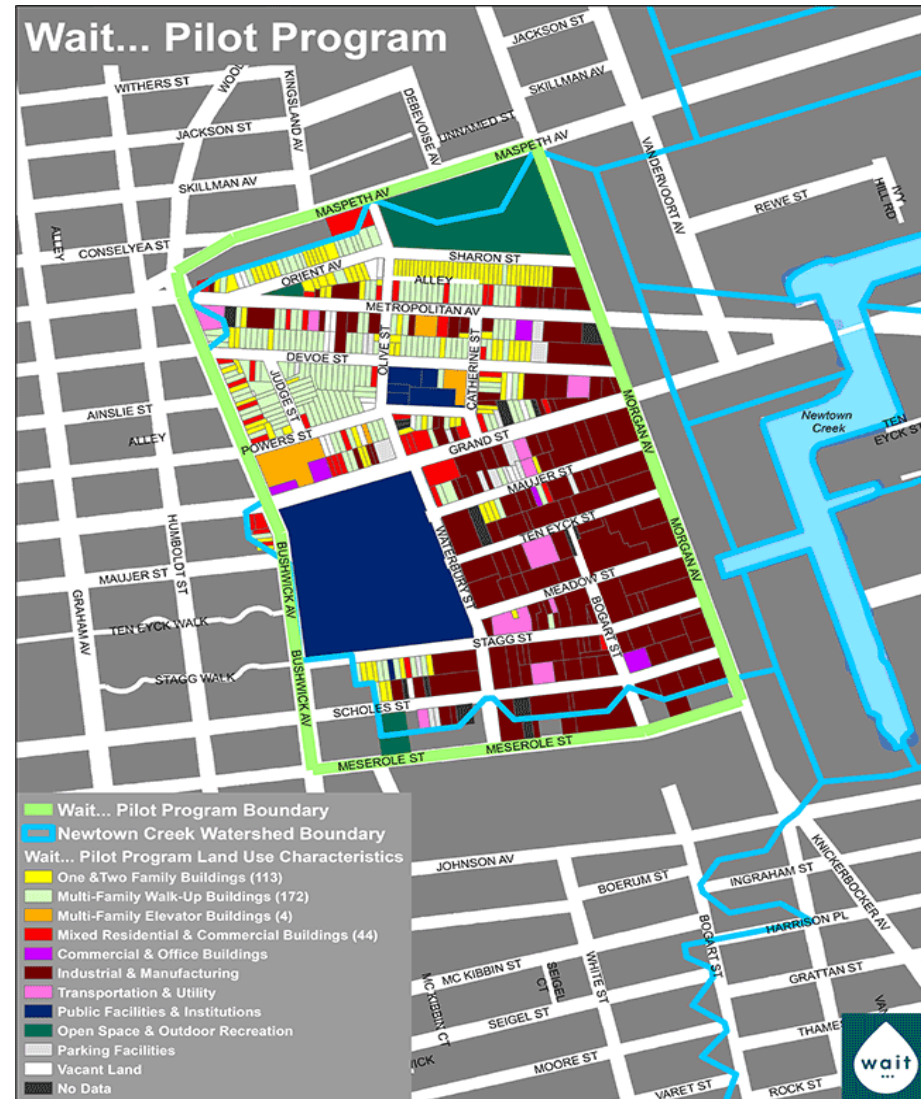
Completed or underway per Waterbody / Watershed Facility Plan (WWFP)

Questions?

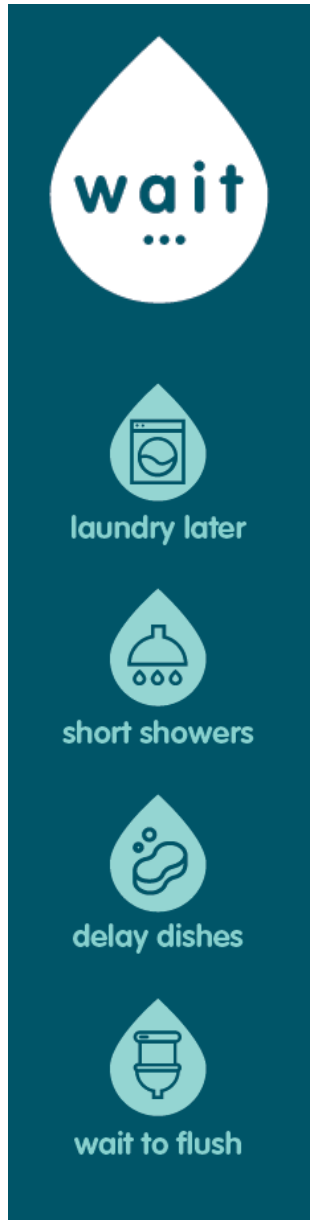
How *You* Can Help & Next Steps

Mikelle Adgate
Director of Stormwater Outreach
DEP – BPA

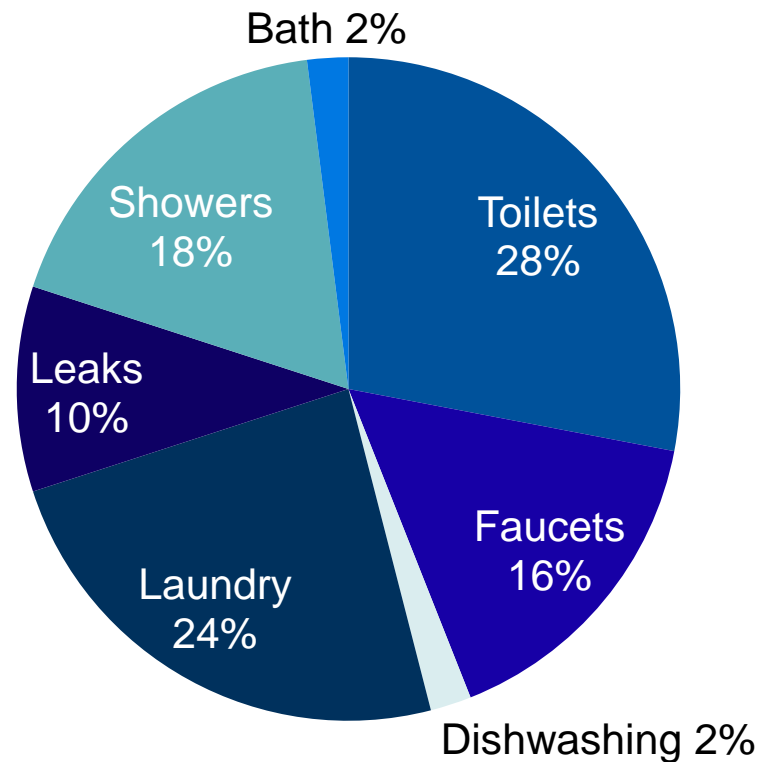
- Water quality program that encourages residential participants to **postpone typical household water uses** (i.e, laundry, dishwashing, etc.) **during heavy storm**
- **Text 38671** with **wait-nycdep** start to join



Wait... Pilot Program

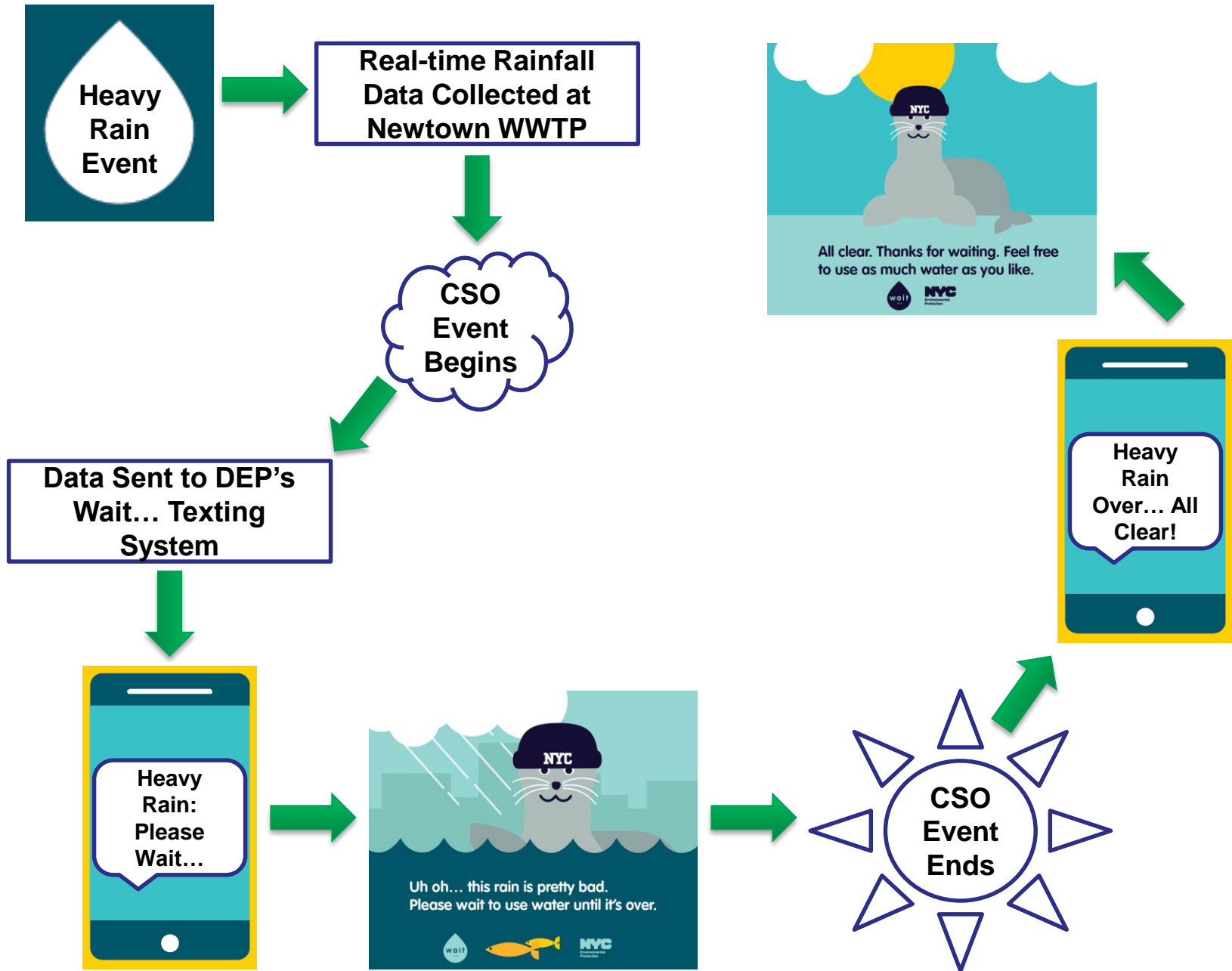


- Wait... is a water quality improvement pilot program that encourages residential participants to voluntarily postpone water use during combined sewer overflow (CSO) events
- Goal: increase capacity in combined sewer system during large storm events and reduce concentration of wastewater in CSOs
- Target: residential water uses individuals can choose to delay
- DEP is first water utility in US to pilot this type of behavior modification program
- Technical, creative and outreach components



Indoor water use in a typical single-family home






Wait... Pilot Program – How it Works



Wait... Pilot Program – Preliminary Results

- Pilot monitoring phase: June 6 to November 30, 2016
- Number of pilot participants in Newtown Creek sewershed: 379
- Water consumption used as metric: if participants use less water during a CSO event, compared to what they normally use (baseline consumption), they “waited”
- Number of CSO events to date: 7
 - Participants “waited” 4 out of 5 CSO events; analysis pending for 2 events

Wait... Pilot Program Preliminary Results and Data

CSO Event	Percent Change from Baseline Consumption
#1	5% reduction 
#2	2% reduction 
#3	2% increase 
#4	7% reduction 
#5	10% reduction 
#6	<i>Data/Analysis Pending</i>
#7	<i>Data/Analysis Pending</i>

Questions?

- Newtown Creek LTCP Public Meeting #2, Spring 2017
 - LTCP Submittal to NYS DEC in June 2017

- Public Comments will be accepted through **Dec. 15, 2016**
 - There will be subsequent comment periods following the alternative and final plan review meetings.

- Comments can be submitted to:
 - New York City DEP at: ltcp@dep.nyc.gov

- Visit the informational tables tonight for handouts and poster boards with detailed information

- Go to www.nyc.gov/dep/ltcp to access:
 - LTCP Public Participation Plan
 - Presentation, handouts and poster boards from this meeting
 - Links to Waterbody/Watershed Facility Plans
 - CSO Order including LTCP Goal Statement
 - NYC's Green Infrastructure Plan
 - Green Infrastructure Pilots 2011 and 2012 Monitoring Results
 - NYC Waterbody Advisory Program
 - Upcoming meeting announcements
 - Other LTCP updates